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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,399	01/29/2004	Chirag Deepak Dalal	VRT0129US	2875

60429   7590   10/12/2007
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EXAMINER
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ART UNIT	PAPER NUMBER
2186	

MAIL DATE	DELIVERY MODE
10/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/767,399	DALAL ET AL.
	Examiner	Art Unit	
	Michael Krofcheck	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>10 August 2007</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1,2,4-14 and 16-24</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,2,4-14 and 16-24</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>29 January 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   This office action is in response to the RCE filed on 8/10/2007.

2.   Claims 1-2, 5, 13-14, 17 have been amended.

3.   Claims 3, 15, 25-26 have been cancelled.

4.   The objections/rejections from the prior correspondence not restated herein have

been withdrawn.

Claim Rejections - 35 USC § 112

5.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

6.   Claims 5, 12, 17, 24 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention.

7.   Claims 5, 12, 17, 24 recite the limitation "the second logical volume" in each

claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

9.   The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

    1.   Determining the scope and contents of the prior art.
    2.   Ascertaining the differences between the prior art and the claims at issue.
    3.   Resolving the level of ordinary skill in the pertinent art.
    4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

10.   Claims 1-2, 4-14, 16-24 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Bridge, US Patent 6405284, Vishlitzky et al., US patent 5819310,

and Soejima et al., US patent application publication 2003/0074528.

11.   With respect to claim 1 and 13, Bridge teaches of a medium for storing computer

executable instructions, wherein a method is performed in response to executing the

instructions (column 26, line 55-column 27, line 44); the method comprising: in response

to a request to perform a plurality of operations on a plurality of logical volumes,

identifying a first storage region of a plurality of storage regions available for

allocation for a first operation of the plurality of operations on a first logical volume of

the plurality of logical volumes (fig. 11, items 1102, 1104; column 1, lines 35-51; column

19; lines 24-61);

    , Vishlitzky teaches of a mirrored set, mirroring data from one logical volume

to another (fig. 1; column 6, lines 25-40; thus multiple logical volumes);

    The combination of Bridge and Vishlitzky teaches of determining whether

each of the remaining operations of the plurality of operations can be performed on

the remaining volumes of the plurality of logical volumes using one or more subsets

of the plurality of storage regions, wherein the one or more subsets exclude the first storage region (Bridge, fig. 11, items 1106; column 1, lines 35-51; column 19; lines 24-61).

allocating the first storage region for the first operation (fig. 11; column 19, lines 24-45).

Bridge fails to explicitly teach of allocating the first storage region for the first operation if said determining determines that each of the remaining operations can be performed.

However, Soejima teaches of allocating the first storage region for the first operation if said determining determines that each of the remaining requirements can be satisfied (fig. 4; paragraph 43-44).

It would have been obvious to one of ordinary skill in the art having the teachings of Bridge and Vishlitzky at the time of the invention to include locating the full mirrored partners on different logical volumes from each other. Their motivation would have been to facilitate reading operations from a mirrored pair of drives (Vishlitzky, column 4, lines 39-41).

It would have been obvious to one of ordinary skill in the art having the teachings of Bridge, Vishlitzky, and Soejima at the time of the invention to determine if there are adequate full mirror partners to a primary extent before allocating the primary extent in the combination of Bridge and Vishlitzky as taught in Soejima. Their motivation would have been to streamline the allocation process, increasing efficiency and performance (Soejima, paragraph 15-16).

12.   With respect to claim 2 and 14, the combination of Bridge, Vishlitzky, and Soejima teaches of if said determining determines that each of the remaining operations cannot be performed using the one or more subsets of the plurality of storage regions, identifying a third storage region of the plurality of storage regions available for allocation for the first operation (Bridge, fig. 11; column 1, lines 35-51; column 19; lines 24-61; as when a sufficient mirror partner cannot be found, the primary extent is deallocated and a new primary parity extent is selected at 1102 again), and

determining whether each of the remaining operation of the plurality of operations can be performed using a one or more subsets of the plurality of storage regions, wherein the one or more subsets exclude the third storage region and include the first storage region (fig. 11, items 1106; column 1, lines 35-51; column 19; lines 24-61).

13.   With respect to claim 4 and 16, the combination of Bridge, Vishlitzky, and Soejima teaches of identifying a respective set of rules to configure each respective logical volume of the plurality of logical volumes prior to identifying the first storage region, wherein the respective set of rules for each respective logical volume is used to identify a respective storage region to allocate for the respective logical volume (Bridge, fig. 11; column 19, lines 40-44; the round robin algorithm is used to distribute the location of the extents across the disk drives).

14.   With respect to claim 5 and 17, the combination of Bridge, Vishlitzky, and Soejima teaches of wherein the determining whether each of the remaining operations can be performed comprises examining a second respective set of rules for the second logical

volume (Bridge, fig. 11; column 19, lines 45-54; the other extents must be located in only the full mirror partners).

15.   With respect to claim 6 and 18, Bridge teaches of determining a respective storage region to allocate for each respective operation of the set of operations by determining whether a remaining operation of the set of operations can be performed using an unallocated subset of the plurality of storage regions, wherein the remaining operation excludes the respective operation, the unallocated subset excludes the respective storage region, and the unallocated subset excludes an allocated subset of the plurality of storage regions wherein each storage region in the allocated subset is allocated to one of the set of operations (fig. 11; column 19, lines 24-61).

16.   With respect to claim 7 and 19, Bridge teaches of wherein each operation of the set of operations is one type of operation (fig. 11; column 19; lines 24-61; the first operation is a parity extent allocation; the second operation is a data extent allocation, the third operation is a store of management information).

17.   With respect to claim 8 and 20, Bridge teaches of wherein a first operation of the set of operations is a first type of operation (fig. 11; column 19; lines 24-61; the first operation is a parity extent allocation),

a second operation of the set of operations is a second type of operation (fig. 11; column 19; lines 24-61; the second operation is a data extent allocation), and

the first type and the second type are different (fig. 11; column 19; lines 24-61; the parity extent allocation is different from the data extent allocation as there are

different requirements that must be fulfilled. Additionally, the store of management information can also be interpreted as a second operation).

18.   With respect to claim 9 and 21, Bridge teaches of wherein the first storage region conforms to a first intent of the first logical volume (fig. 11; column 19, lines 24-27, lines 40-44; the location for the parity extent is selected based on the round robin algorithm. Doesn't any storage region that is a logical volume conform to the intent of that logical volume. It must satisfy the requirements of the logical volume to be allocated as the logical volume).

19.   With respect to claim 10 and 22, Bridge teaches of wherein the first intent comprises a first rule used to configure the first storage region to provide the first logical volume (fig. 11; column 19, lines 24-27, lines 40-44; the round robin algorithm (first rule) is used to select the storage location for the parity extent).

20.   With respect to claim 11 and 23, Bridge teaches of performing the first operation on the first logical volume using the first storage region (fig. 11, items 1102, 1104; column 1, lines 35-51; column 19; lines 24-61).

21.   With respect to claim 12 and 24, Bridge teaches of wherein one operation of the set of operations is one of the following: creating the first logical volume; growing the second logical volume; and adding a mirror to a third logical volume of the plurality of logical volumes (fig. 8, 9, 10a, 19, items 802-804, 910, 1004 respectively; column 16, lines 33-47; column 17, lines 27-34; column 17, lines 62-66; column 26, lines 57-65).

Response to Arguments

22.   Applicant's arguments with respect to the claim have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

23.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Krofcheck whose telephone number is 571-272-8193. The examiner can normally be reached on Monday - Friday.

24.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

25.   Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael Krofcheck
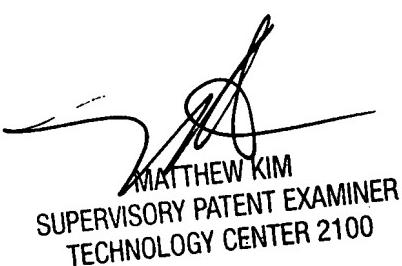
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